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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/606,882 | 06/24/2003 | Koji Otsuka | FLK 20.377 | 5171 |
| 26304 | 7590 | 12/19/2005 | EXAMINER | |
| KATTEN MUCHIN ROSENMAN LLP 575 MADISON AVENUE NEW YORK, NY 10022-2585 | | | LOPEZ, CARLOS N | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1731 | |

DATE MAILED: 12/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/606,882

Applicant(s)

OTSUKA, KOJI

Examiner

Carlos Lopez

Art Unit

1731

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 9-11 and 13-15 is/are rejected.
- 7) ☒ Claim(s) 1-8, 12 and 16 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/24/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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DETAILED ACTION

Priority

Amendment to the specification reflecting the status of the parent application 09/608/034 is requested.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "the atmosphere" makes it unclear to which atmosphere is being referred to. Is it the atmosphere during the removing step or the sintering step?

For examination purposes, the phrase "the atmosphere" will be read as referring to the atmosphere of the removing step.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates et al (US 6,004,624) in view of Oiwa et al. (US 5,868,884) and in further view of any one of Kwon (US 6,069,103), Chatterjee et al (US 6,156,246) and/or Saitoh et al.

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(US 4,784,812). Bates discloses a method of making a multilayer ceramic component. The process comprises removing organic materials/binders from an un-sintered multilayer ceramic body by heating it (Col. 1, line 38), and sintering the ceramic body. The binder used by Bates is an ethyl cellulose binder; see Col. 3, lines 52-53. Bates is silent disclosing the residual binder in neither the multilayer ceramic body nor the atmosphere at which the ceramic body is sintered.

However, Oiwa teaches that sintering of ceramics is done in a reductive atmosphere comprised of comprised of hydrogen and nitrogen, see claim 1 and Col. 5, lines 13-17. Additionally, Kwon (US 6,069,103), see col. 6 lines 10ff, Chatterjee et al (US 6,156,246), see col. 5, lines 30ff, and/or Saitoh et al. (US 4,784,812), see table 1, all disclose that conventional de-binding methods still leave behind a binder content of at least .5% by weight.

Absent any indication by Bates in disclosing the type of sintering and de-binding method used, a person of ordinary skill in the art, in replicating or practicing the invention of Bates would use known methods of sintering and de-binding methods such as those disclosed by the above references. Hence, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art, to have used known methods of sintering and de-binding ceramics, which mirror the claimed invention, as disclosed by the above noted references in order to obtain the sought ceramic products of Bates et al.

Claims 2-4, 6-8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates et al (US 6,004,624) in view of Oiwa et al. (US 5,868,884) and

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in further view of any one of Kwon (US 6,069,103), Chatterjee et al (US 6,156,246) and/or Saitoh et al. (US 4,784,812) as applied to claims 1 and 5 above, and in further view of Danforth et al. (US 5,997,795). Bates, Kwon (US 6,069,103), Chatterjee et al (US 6,156,246) and/or Saitoh et al. (US 4,784,812) are silent disclosing the specific process parameters for binder removal. However, Danforth teaches that debinding of ceramics is achieved by increasing the temperature to thermally decompose, pyrolysis, the binder (Col. 14, lines 15ff) and is done, inter alia, in a reducing atmosphere, inert atmosphere, also deemed as the claimed neutral atmosphere, and/or high pressure.

Absent any indication by Bates, Kwon (US 6,069,103), Chatterjee et al (US 6,156,246) and/or Saitoh et al. (US 4,784,812) in disclosing process parameters for binder removal, a person of ordinary skill in the art, in replicating or practicing the invention of Bates would use known process parameters as those disclosed by Danforth. Hence, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art, to use the binder removal process parameters of Danforth in order to remove the binder from Bates' ceramic.

As for claim 3, a reductive atmosphere encompasses hydrogen and nitrogen, see Col. 5 lines 15ff of Oiwa et al.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bates et al (US 6,004,624) in view of Oiwa et al. (US 5,868,884) and in further view of any one of Kwon (US 6,069,103), Chatterjee et al (US 6,156,246) and/or Saitoh et al. (US 4,784,812), and in further view of Danforth et al. (US 5,997,795), as applied to claim 1 above, and in further view of Lipp (US 5,406,058) or Brands et al (US 6,142,774).

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Bates, Kwon (US 6,069,103), Chatterjee et al (US 6,156,246) and/or Saitoh et al. (US 4,784,812) are silent disclosing where the ceramic body is placed for binder removal. However, in view of the teachings of Danforth, teaching that binder removal is done by thermally decomposing the binder, diffusion and evaporation, a person of ordinary skill in the would appreciate the teachings of Lipp and Brands. Lipp and Brands disclose supports for firing ceramic green bodies allows for improved atmospheric circulation. In view that part of the binder is removed through evaporation, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art, to used the supports of Lipp and Brands to remove the binders as taught by Bates, Kwon (US 6,069,103), Chatterjee et al (US 6,156,246) and/or Saitoh et al. (US 4,784,812) and Danforth, in order to improve the removal of the binder through evaporation.

Allowable Subject Matter

Claims 9-11 and 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the primary reason for allowance is that the prior art fails to disclose or reasonably suggest the claimed removal of the binder as recited in claims 9-11 and temperature and pressure profile recited in claims 13-15.

Conclusion


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The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reference A and B in PTO-892 have been cited to show the state of the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Lopez whose telephone number is 571.272.1193. The examiner can normally be reached on Mon.-Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571.272.1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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